CLAIMS

1. A process for producing PNPase, comprising at least the following steps:

(A) a step of constructing an expression vector comprising a prokaryote-derived PNPase gene integrated into a plasmid having a T7 promoter as an expression-regulating signal;

(B) a step of transforming *Escherichia coli* or its analogous bacteria having a T7 RNA polymerase gene using the expression vector;

(C) a step of allowing the resulting transformant to express the PNPase gene thereby accumulating PNPase in the bacteria; and

(D) a step of recovering the bacteria having PNPase accumulated therein, and extracting and purifying the PNPase.

2. The process according to claim 1, wherein the steps (C) and (D) are the following steps (C') and (D') respectively:

(C') a step of allowing the transformant to express the PNPase gene thereby accumulating PNPase in the bacteria, and further continuing to allow expression until the bacteria is disrupted to release the PNPase into a supernatant outside of the bacteria; and

(D') a step of recovering and purifying the PNPase released in the supernatant.

3. The process according to claim 1 or 2, wherein the plasmid has a tag gene capable of adding a tag to the PNPase to be produced.

4. The process according to claim 3, wherein the tag gene is a His tag gene, T7 tag gene, S tag gene, Nus tag gene, GST tag gene, DsbA tag gene, DsbC tag gene, CBD_{cex} tag gene, CBD_{cenA} tag gene, CBD_{clos} tag gene, Trx tag gene, HSV tag gene, or 3×FLAG tag gene.

5. The process according to any one of claims 1 to 4, wherein the prokaryote is *Escherichia coli*.

6. The process according to claim 5, wherein the *Escherichia coli* is *Escherichia coli* K12 or *Escherichia coli* O157.

7. The process according to any one of claims 1 to 6, wherein the *Escherichia coli* having a T7 RNA polymerase gene is *Escherichia coli* BL21 [DE3], *Escherichia coli* BL21 [DE3] pLysS, *Escherichia coli* BLR [DE3], *Escherichia coli* Rosetta [DE3], or *Escherichia coli* B834 [DE3].

8. A synthetic nucleic acid polymer produced by using PNPase produced by the process of

any one of claims 1 to 7.

9. The synthetic nucleic acid polymer according to claim 8, wherein the synthetic nucleic acid polymer is polyinosinic acid, polycytidylic acid, polyuridylic acid, polyadenylic acid, polyguanylic acid, poly(5-bromocytidylic acid), poly(2-thiocytidylic acid), poly(7-deazainosinic acid), poly(2'-azidoinosinic acid), poly(cytidine-5'-thiophosphoric acid), poly(1-vinylcytidylic acid), poly(cytidylic acid, uridylic acid), poly(cytidylic acid, 4-thiouridylic acid), or poly(adenylic acid, uridylic acid).